Bench Top DIY Router Table

Kevin S. Brady

Search the Internet for "router table plans" and you will likely find a dizzying array of available plans, some free and some not-so-free. Most are for self-standing units, many of which have cabinets beneath the table. There are router tables to be found in stores, but I wasn't impressed with many of those either, and certainly didn't want to pony up $200-300 to get one. I simply wanted a basic, robust table that suited the needs of a weekend hobbyist. Since I am quickly running out of available floor space in my garage-turned-woodshop, I chose to build a small router table that could be placed atop a bench or saw horse. I wanted to be able to clamp it to any surface, and stash it away when it's not being used. Rather than sift through the many plans available, I decided to just design and build my own from scratch and document the process here for others.

Here is a chronicle of my project. Since I used many components I already had on hand, the design is a bit idiosyncratic, but you should get the general idea here and have no problem adapting the design to your own needs and specifications. Depending on the materials you use, the cost for the project should range from roughly $75 to $125. Your mileage may vary. How you approach this depends on your needs. If your hobby is primarily small crafts, such as plaques or birdhouses, a smaller table might suffice. Conversely, if you intend to build furniture or cabinetry, you will see the need for a large table. In any case, building your own is still much cheaper than buying most of the flimsy models offered at the home center stores. I hope these plans help you to build a great router table. Good luck!

I. Basic Construction Considerations.

As with any woodworking project, safety is key. Before starting, make sure you fully understand the operation of the power and hand tools you will be using. Use good personal safety equipment, including respirators, ear and eye protection.

a) Tabletop.

Ideally, you will want a table surface that is as flat as possible, dimensionally stable, and smooth. The lower the coefficient of friction on top, the better. I have never liked aluminum as a surface for wood to slide across - it's just too "sticky" and aluminum has the infuriating habit of creating burrs that scratch the wood.

If money is no object and you are willing to plunk down $10/ft^2 or more, you can cover the table surface with a sheet of UHMW (ultra high molecular weight) polyethylene. But if you want the best bang for the buck, you can't beat good-old kitchen countertop laminate, such as Formica$_{TM}$. You can find good-sized scraps of countertop material at some lumber dealers, salvage firms or local cabinet shops. However the problem with this material is the particle board typically used as a substrate. While dimensionally stable as a counter top substrate, particle board makes for crappy router tables as it is difficult to machine well and has poor ability to hold fasteners. This is an important consideration as you will be routing recesses and affixing bolts and screws to the material. Therefore, it is much better to simply get a piece of the plastic countertop laminate and bond it to a more suitable substrate.

Call a local cabinet shop and ask them if they have any scraps of laminate they want to get rid of. You might be able to get a good sized piece of countertop laminate for a few bucks, though you may not be able to be picky about color. I picked up a 22" x 29" scrap on the cheap. It has a real ugly tan-colored marbled print pattern, but I don't care - the price was right. Make sure you get one with a gloss or smooth finish, and not a textured surface. You can then apply the laminate to the substrate of your choice using contact cement. Baltic birch plywood or medium-density fiberboard (MDF) works well as a substrate. I chose 3/4" MDF, as it is available everywhere and works quite well. I picked up a 4' x 8' sheet at Lowe's for about $20, and a quart of contact cement for about $6. A double layer of 3/4" MDF makes a very stable router tabletop.

b) Fence

I already had a fence mechanism that I adapted for this design; consequently these plans do not include much discussion in the way of a fence assembly. My fence mechanism was purchased from a used tool shop, a part salvaged from an old ShopSmith$_{TM}$ machine. All I had to do was construct two fence members for the fence, and I will discuss the construction of this in my plans.

c) Insert plate.

You can buy pre-made insert plates from many woodworking supply sources. They are typically made of polycarbonate, phenolic, or anodized aluminum. You can purchase these plates in many configurations; some of them simple and some incorporating lift mechanisms for your router. They're all rather expensive - even the simple ones cost $30 or more. But having a bunch of 1/4" thick Plexiglas$_{TM}$ on hand, I opted to make my own plate.

d) Pedestal.
Since this is a bench top design, all that is really necessary is a sturdy pedestal just tall enough to allow clearance for your router, and a flange along the bottom edge for clamping or mounting to a bench or other surface. A similar flange along the top edge of the pedestal facilitates attachment to the underside of the tabletop. Plywood or MDF works well for the pedestal sides, with hardwood strips for the flanges. I mounted a switch and a duplex electrical outlet to the side of the pedestal to provide a power source for my router.

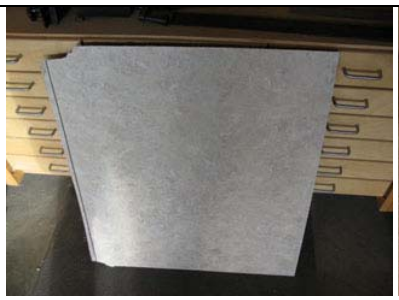
e) Hardware.
You will need various bolts, screws, and other fasteners. My design included horizontal T-tracks on the fences for mounting feather boards and stops, and a miter track built in to the table, parallel to the fence. I positioned the tracks to accommodate the Bench Dog Feather-Loc$_{TM}$ feather board, which extends 1" - 6" from the edge of the track, but you can place your tracks to adapt to whatever feather boards you choose. These tracks are made of extruded aluminum, and are readily available in 2 to 4 foot lengths from many woodworking sources, like Amazon, Rockler, and Woodpeckers. I attached strips of UHMW to create a slick surface on the fences. Lengths of UHMW are also available from the above-mentioned sources.

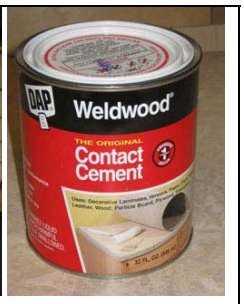
II. Construction and Assembly.

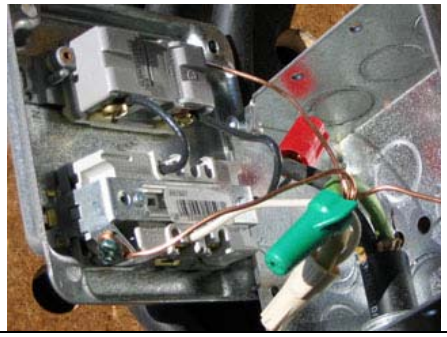
I constructed the insert plate from 1/4" thick Plexiglas$_{TM}$, and it measures about 8.5" x 11". I drilled a 2" diameter hole in the center, and three countersunk mounting screw holes to accommodate my Porter Cable 890 router. I drilled and countersunk holes along the edges for mounting into the table. Flat head machine screws with T-nuts were used to bolt the plate into the recess. Since I was planning to make a recess into the tabletop using a 1" diameter straight router bit, I chose to round off the corners of the plate (1/2" radius), so that I wouldn't have to square off the corners of the recess. Plexiglas$_{TM}$ has a low melting point, so go slow with cutting and drilling tools, so as to prevent melting and distortion of the material.

You can also use polycarbonate, metal, birch plywood, masonite board, or other hard, smooth materials for your insert plate.

My low-cost scrap of countertop laminate obtained from a local cabinet shop. After removing the bad corners, I ended up with a nice 22" x 29" piece for my tabletop. The band saw works well for cutting this stuff, but be sure to place a length of masking tape over the cut line to minimize chipping when sawing. Make sure the good side is facing up, so that any chipout from the band saw teeth occurs on the backside. Cut the laminate slightly larger than the piece of substrate it will attach to, so you have an edge to trim off later. I used contact cement to bond the laminate to the MDF substrate.







I assembled a switch and duplex electrical outlet, and mounted it on the side of the pedestal to provide a power source for my router. The outlet can be wired such that one or both receptacles are switched, depending on your particular needs.

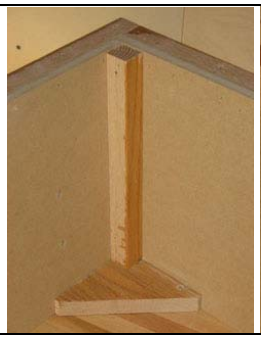
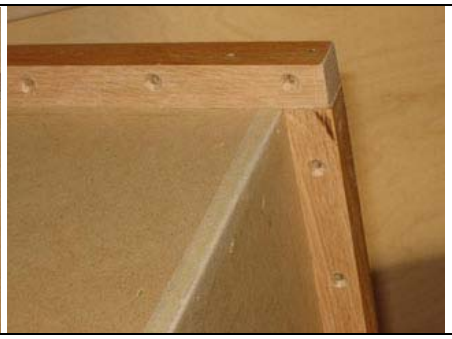
One wiring scheme involves having one receptacle switched for the router, and the other receptacle unswitched (constantly on) for a lamp. Break off the connecting lug between the top and bottom receptacles and wire each one separately. In a second wiring scheme, both receptacles are switched (the connecting lug is left intact), thereby providing switched power to simultaneously turn on the router and a shop vacuum.

My fence mechanism, salvaged from an old ShopSmith$_{TM}$. I picked this up at a local tool consignment shop, as part of someone's crappy shop-built aluminum router table. The table was junk and I tossed it, but I kept the cool ShopSmith$_{TM}$ fence assembly shown here. Note the slotted mounting flanges in the photo at bottom right. This allows the fence members (not shown) to be moved 1" left or right to accommodate different diameter bits.

If you're not lucky enough to stumble onto something like this, you can buy a commercial fence from a woodworking supply firm, or better yet, build your own from scratch. Your shop-built fence can be as simple as 2 strips of MDF or plywood attached at right angles, positionable along T-tracks. Your fence need not be fancy, just so it is movable and maintains a right angle to the table.

Cap screws and T-nuts used for the fence. In the left photo are 5/16-18 x 3" cap screws with T-nuts for attaching the fence mechanism to the tabletop. On the right are 5/16-16 x 1" cap screws and T-nuts for attaching the fence members to the fence mechanism.

The pedestal was constructed from 1/2" MDF with 1" x 1-1/2" hardwood flanges and 1" x 1" corner battens. Due to the open frame construction of the pedestal, corner braces add some needed lateral strength at the bottom to prevent racking. All parts here were attached using wood glue and a narrow-crown stapler.

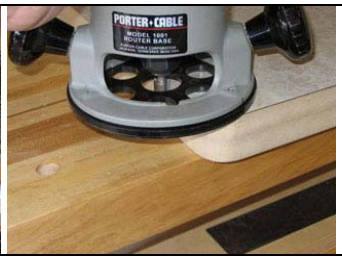



Closer view of the pedestal, showing the hardwood corner batten and brace (L), and mounting flange (R). The mounting flange attaches to the underside of the router tabletop using wood screws. I drilled and countersunk holes at 3" intervals in the top flange for the screws.

Cutting the 3/4" MDF for the tabletop. I cut 2 identical 22" x 29" pieces and laminated them together with wood glue to make a single 1-1/2" thick piece. As you can see, one can never have too many clamps on hand…

I rounded the corners of the tabletop using a jigsaw, and hand sanded the corners.

Bonding the plastic laminate to the MDF. Cut the laminate about 1/8" larger in length and width than the MDF, so there is a bit of overhang to trim later. I applied contact cement to both surfaces with a 3" thin-nap roller, but an old paintbrush will work fine. After 15 minutes to allow the cement to get "tacky," I attached the two surfaces together. Be sure to align the 2 pieces very carefully before placing them together - you only get one chance at this. Once they make contact, they are bonded! After attaching the laminate, roll over the surface of the laminate with a veneer roller to remove air bubbles and ensure flatness. Work from the center outward. Clamp the piece to a bench until the cement is cured, which requires a day or so.

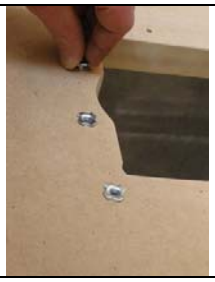
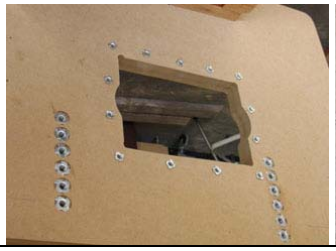
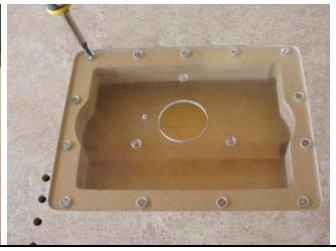


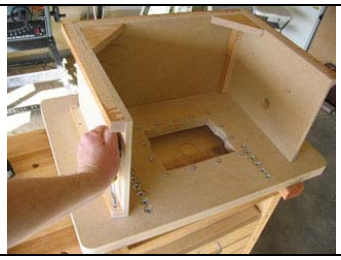
After the cement had cured sufficiently (about a day), I trimmed the edges of the laminate with a router and a laminate trim bit.

I drilled two rows of 5/16" diameter holes in the tabletop for attaching the fence at 1" increments. I inserted 5/16-18 T-nuts into the holes on the backside.

I cut a rectangular opening in the tabletop with a jigsaw and routed a 1/4" deep recess for the router insert plate using a rabbeting bit.

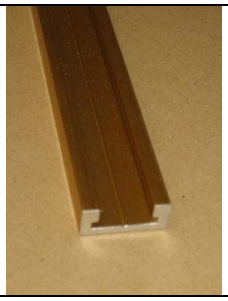
I drilled a series of holes along the perimeter of the recess for mounting the insert plate. I used #10-24 T-nuts and flat head machine screws.

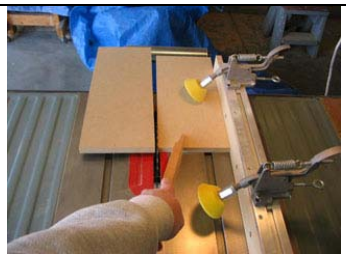






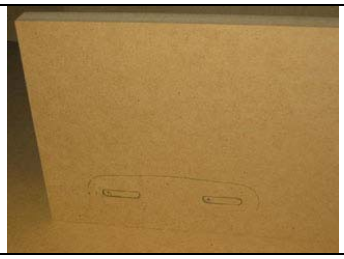
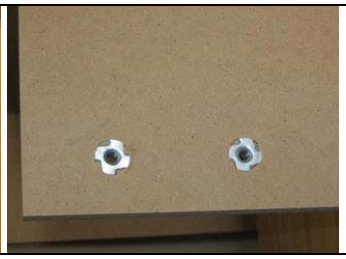
I attached the tabletop to the pedestal using #10 x 2" woodscrews.

I routed a dado for the miter track. I used epoxy to mount the track into the dado. The miter gauge from my table saw now serves double duty.

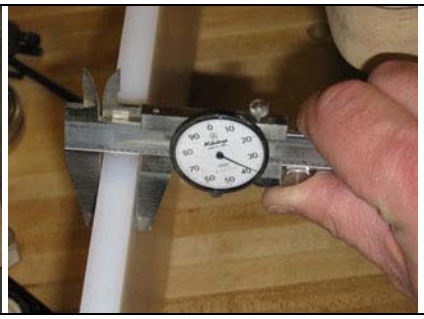




The fence members were made from 3/4" MDF. I drilled 5/16" diameter holes and mounted T-nuts for attachment to the fence mechanism.

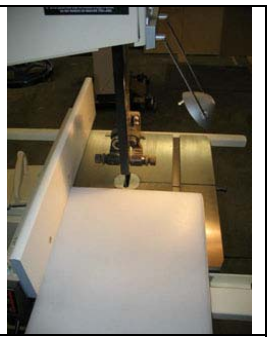



I attached a horizontal reinforcement piece to the backside of the fence member to provide more rigidity.



I ordered a sheet of 1/2" thick UHMW on the Internet. However, to my surprise, the thickness of the sheet varied greatly from its 0.500" nominal, ranging from 0.490" to 0.545" actual thickness. This presented a challenge, as I was forced to shim the UHMW.

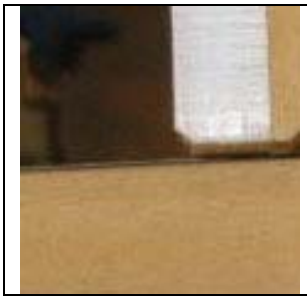
The UHMW sheet is easily cut on the band saw, and the edges can be trimmed on a jointer.



I attached the UHMW to the MDF using wood screws driven from the back, as adhesives don't adhere well to the slippery plastic. I'm told that there are thin sheets of UHMW available with a self-adhesive backing, but I haven't tried any of this. Which begs the question: If UHMW is so slippery, what kind of adhesive do they use to make it stick? I'll leave you with that puzzling question…

Due to the thickness variations of the UHMW, I applied a staggered thickness of shim material to provide a consistent height of the UHMW. This resulted in an overall thickness of about 0.550" for the UHMW. Since the T-track is exactly 0.500," I shimmed the track to bring it up flush with the plastic.

The T-track was easily mounted to the underlying MDF with pan-head sheet metal screws.



I cut a small chamfer along the bottom front edge of the UHMW to prevent dust buildup from interfering with the path of wood being fed into the router.

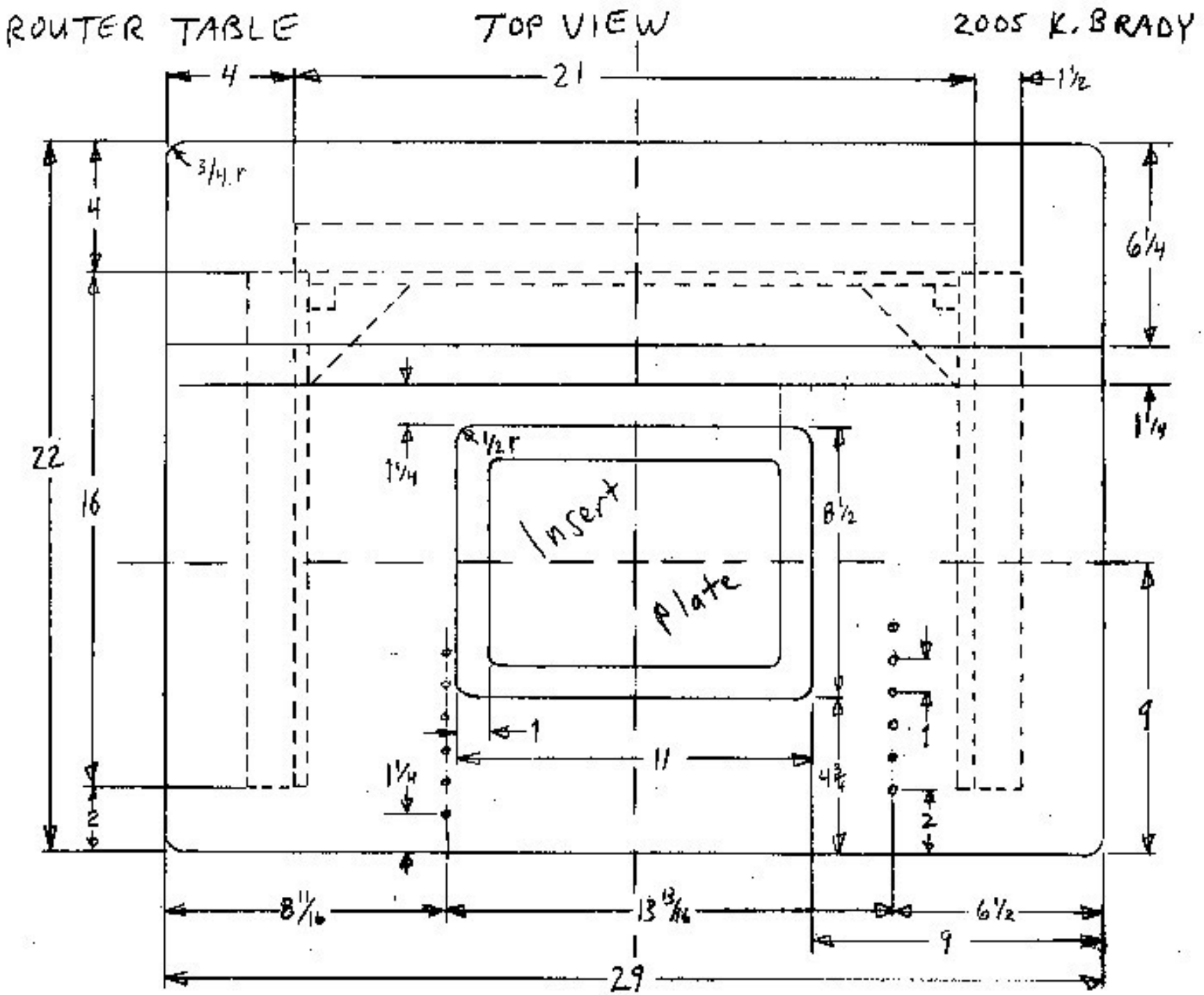
A view of the router table with the switch/outlets and cord set attached.

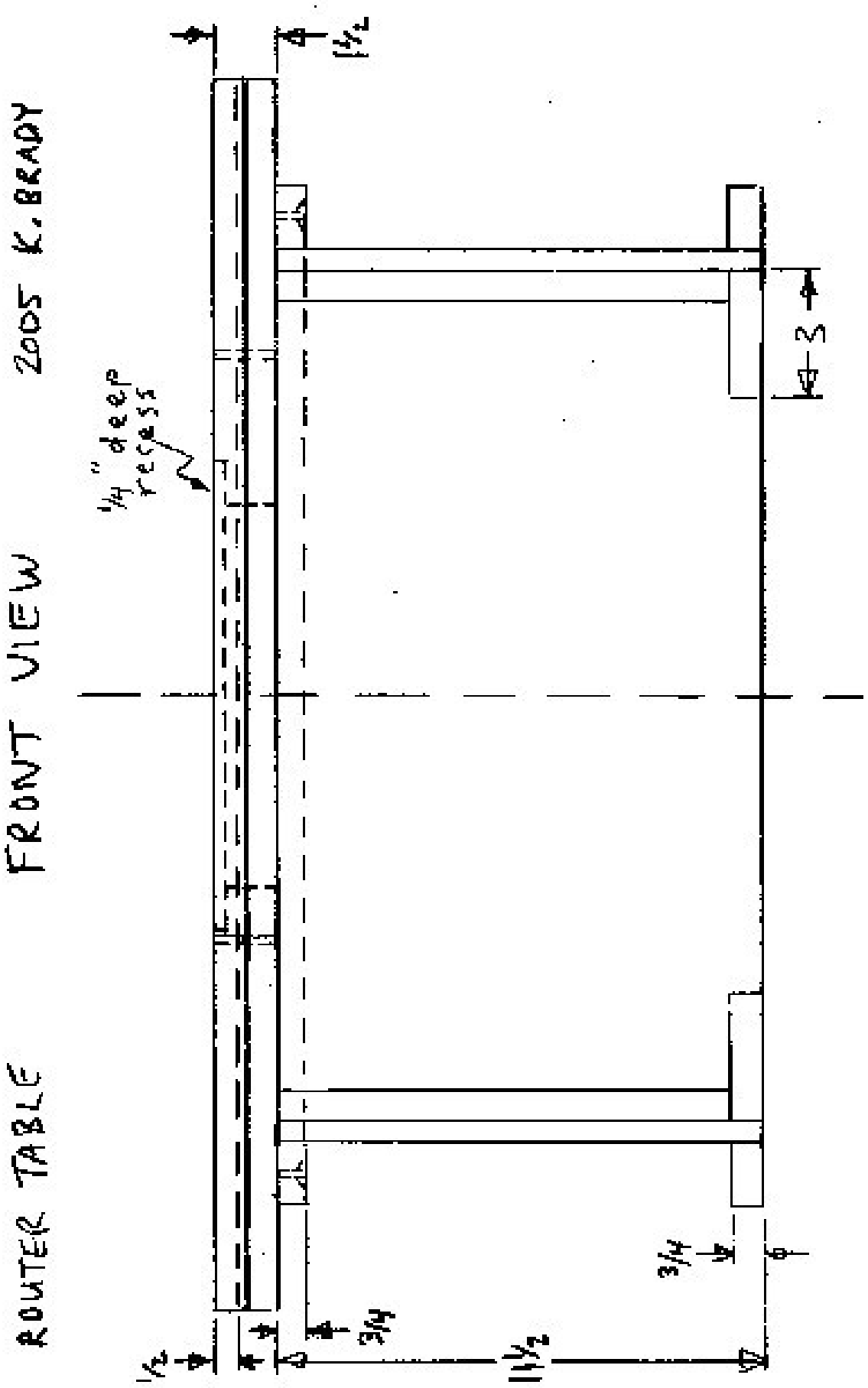
Views of the router table with the fences installed.

The router table with featherboard attached.

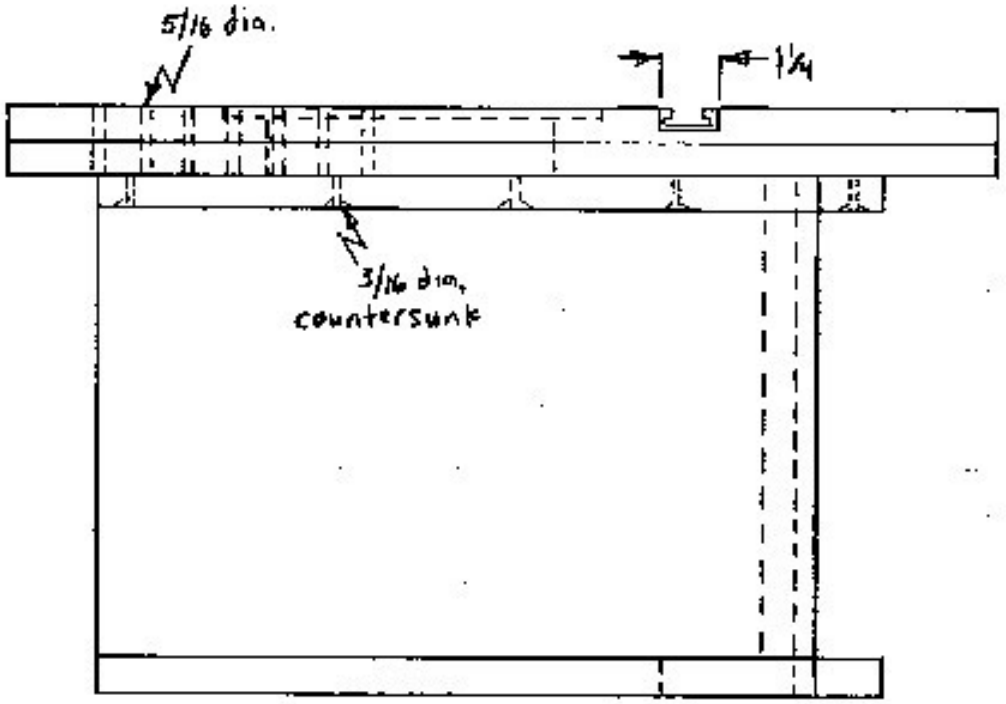
Router table as viewed from the rear (upper left photo). An added touch of a halogen task lamp (lower right) that I picked up from Ikea for $10.

III. Dimensional Drawings.

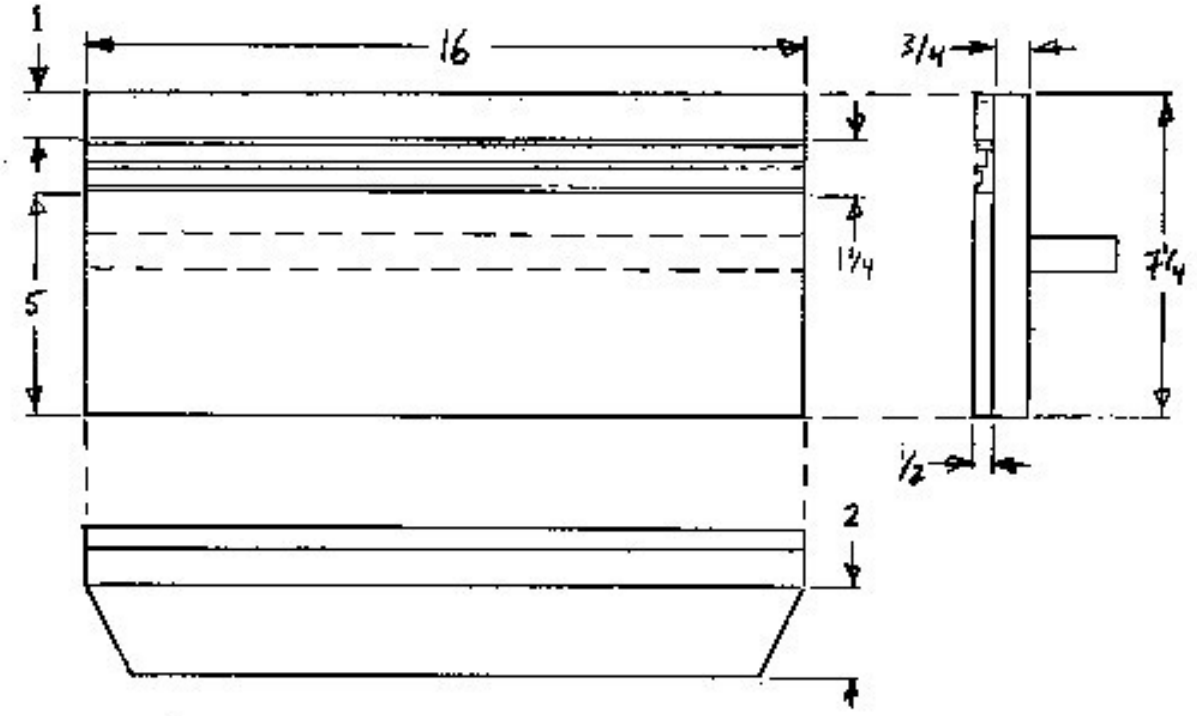

ROUTER TABLE
TOP VIEW
2005 K. BRADY
4
21
1½
3/4 R
4
6¼
1¼
22
16
1¼
R½
Insert
Plate
8½
1
11
1¼
4¾
1
2
2
9
8 11/16
13 13/16
6½
9
29


ROUTER TABLE FRONT VIEW 2005 K. BRADY
1/4" deep recess
1/2
1 1/2
3
3/4
3/4
1 1/2

ROUTER TABLE SIDE VIEW 2005 K. BRADY



FENCE FRONT & SIDE VIEWS 2005 K. BRADY



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